

AMENDMENTS TO THE SPECIFICATION:

Page 1, please add the following new paragraphs before paragraph [0001]:

[0000.2] CROSS-REFERENCE TO RELATED APPLICATIONS

[0000.4] This application is a 35 USC 371 application of PCT/DE 03/03627
filed on October 31, 2003

Please replace paragraph [0001] with the following amended paragraph:

[0001] BACKGROUND OF THE INVENTION ~~Background of the Invention~~

Please add the following new paragraph after paragraph [0001]:

[0001.2] Field of the Invention

Please replace paragraph [0002] with the following amended paragraph:

[0002] The invention is directed to an improved ~~based on a~~ high-pressure fuel pump;
~~known from German Patent DE 101 17 600~~; for a fuel injection system of an internal
combustion engine, ~~having a housing, having a low-pressure inlet, having a supply~~
~~chamber in which the fuel is compressed, and having an intake valve between the~~
~~supply chamber and the low-pressure inlet, in which a valve member of the intake valve~~
~~is braced against a compression spring disposed in the supply chamber.~~

Please insert the following new paragraph after paragraph [0002]:

[0002.2] Description of the Prior Art

Please insert the following new paragraph after paragraph [0002.2]:

[0002.4] A high pressure fuel pump of the type with which this invention is concerned is
known from German Patent DE 101 17 600 which discloses a pump having a housing, a low
pressure inlet, a supply chamber in which the fuel is compressed, and an intake valve between
the supply chamber and the low-pressure inlet, in which a valve member of the intake valve is
braced against a compression spring disposed in the supply chamber.

Please replace paragraph [0003] with the following amended paragraph:

[0003] In this known high-pressure fuel pump, the valve member of the intake valve is embodied as a valve cone.

Please replace paragraph [0004] with the following amended paragraph:

[0004] SUMMARY AND ADVANTAGES OF THE INVENTION

Advantages of the Invention

Page 2, please replace paragraph [0007] with the following amended paragraph:

[0007] With a high-pressure pump employing the intake valve of the invention, it is also assured that all the intake valves of a mass-produced high-pressure fuel pump have virtually identical hydraulic properties, thus simplifying optimization of the mass-produced high-pressure fuel pump.

Page 3, please replace paragraph [0013] with the following amended paragraph:

[0013] The advantages of the invention are understood to come into play in a fuel system with a fuel tank, an injection valve that injects the fuel directly into the combustion chamber of an internal combustion engine, a high-pressure fuel pump, and a fuel collection line to which the at least one injection valve is connected, if the high-pressure fuel pump is embodied in accordance with one of the foregoing features **claims**.

Please add the following new paragraph after paragraph [0013]:

[0013.2] BRIEF DESCRIPTION OF THE DRAWINGS

Please replace paragraph [0014] with the following amended paragraph:

[0014] Further advantages and advantageous features can be learned from the description contained herein below, taken with the drawings, in which: ~~accompanying drawing, its description, and the claims.~~

Please delete paragraphs [0015] and [0016].

Please replace paragraph [0017] with the following amended paragraph:

[0017] ~~Fig. 1,~~ Fig. 1 is a sectional view of a first exemplary embodiment of a radial piston pump of the invention;

Page 4, please replace paragraph [0021] with the following amended paragraph:

[0021] DESCRIPTION OF THE PREFERRED EMBODIMENTS

~~Description of the Exemplary Embodiment~~

Please replace paragraph [0022] with the following amended paragraph:

[0022] Fig. 1 shows a ~~first exemplary embodiment of a high-pressure fuel pump 10 of the invention, in cross section.~~ The high-pressure fuel pump 10 is embodied as a radial piston pump, with three pump elements 11. The pump elements 11 include a piston 13 which is guided in a cylinder bore 15. The cylinder bore 15 is embodied as a blind bore in a housing 17 of the high-pressure fuel pump 10. Via production and assembly bores 19, the cylinder bore can be made. After the assembly of the high-pressure fuel pump of the invention, the assembly bores 19 are closed with plugs 21.

Please replace paragraph [0024] with the following amended paragraph:

[0024] The cylinder bore 15 and the piston 13 define one pump chamber or supply chamber 31 per pump element 11; the volume of the supply chamber 31 depends on the position of the drive shaft. In the pump element 11, oriented vertically upward in Fig. 1, whose piston 13 is

near its top dead center (TDC), the volume of the supply chamber 31 is minimal, while for the other pump elements 11 it is virtually at a maximum. By means of a compression spring 33, the piston base plates 27 and with them the pistons 13 are always kept in contact with the flat faces 25 of the polygonal ring 23.

Page 5, please replace paragraph [0026] with the following amended paragraph:

[0026] The cylinder bore 15, as already noted, is embodied as a blind bore. On the end of the cylinder bore 15, an intake valve 35 is provided, having a sealing seat 37 and a ball 39 that cooperates with the sealing seat 37. The ball 39 is pressed against the ~~valve~~ seat 37, via a spring plate 41, by a compression spring 43 that is braced on its other end on the piston 13.

Please replace paragraph [0027] with the following amended paragraph:

[0027] The compression spring 43 is dimensioned such that at bottom dead center, fuel is not automatically aspirated. If a metering unit, not shown, disposed on the intake side of a high-pressure fuel pump 10, is closed, then the high-pressure fuel pump 10 does not pump any fuel. If the metering unit is fully or partly open, an overpressure generated by a prefeed pump (not shown) builds up upstream of the intake valve 35, by which overpressure fuel is pressed into the supply chamber 31 counter to the compression spring 43. The metering unit has the task of adjusting the overpressure upstream of the suction chamber 31 such that the desired supply quantity is pumped by the high-pressure fuel pump 10.

Please replace paragraph [0028] with the following amended paragraph:

[0028] If the piston 13 has moved in the direction of its top dead center, then the prestressing of the compression spring 43 ~~33~~ increases so sharply that the ball 39 is pressed against the sealing seat 37, and thus the communication between the supply chamber 31 and the low-

pressure inlet 45 is disrupted. This effect is reinforced very substantially by the increasingly higher pressure in the supply chamber 31.

Pages 7-8, please replace paragraph [0039] with the following amended paragraph:

[0039] In Fig. 3, the piston 13 is at top dead center. Accordingly, the supply chamber 31 has its minimal volume, and the ball 39 seals off the supply chamber 31 from the low-pressure inlet 45 of the high-pressure fuel pump 10. This sealing takes place along a circular sealing line (not shown), which results from the line of contact between the ball 39 and the sealing seat 37. The tightness of this intake valve 35 embodied as a ball valve is very high, since there is only linear contact between the ball 39 and the sealing seat 37, resulting in a correspondingly high pressure per unit of surface area on the sealing line. Moreover, the demands for precision in the production of a tightly closing ball valve are less stringent than for conical valves. Depending on ~~how~~ the selected angle α of the sealing seat 37 ~~is selected~~, the diameter of the sealing line between the ball 39 and the sealing seat 37 for a constant ball diameter can be varied. It has been found that seat angles α of between 30° and 150° are possible, and as a rule, a seat angle α of 90° leads to very good results.

Page 8, please replace paragraph [0040] with the following amended paragraph:

[0040] The sealing seat 37 is adjoined by an axial bore 48 and a transverse bore 49. Alternatively, a plurality of transverse bores 49 (not shown) may be provided. The transverse bore 49 discharges into an annular chamber 51 ~~50~~, which is defined by the housing 17 and a reduced-diameter region 50 of the screw 47. On a face end 52 of the screw 47, a biting edge 53 is embodied, which seals off the annular chamber 51 from the supply chamber 31.

Page 9, please add the following new paragraph after paragraph [0045]:

[0046] The foregoing relates to preferred exemplary embodiments of the invention, it being understood that other variants and embodiments thereof are possible within the spirit and scope of the invention, the latter being defined by the appended claims.